Amendments to the Claims:

Please amend claims 35, 39, 43, and 44. Following is a complete listing of the claims pending in the application, as amended:

1. (Original) A passive end-effector for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece, the contact sites including at least a first contact site, a second contact site and a third contact site, wherein the first and second contact sites are on a semicircle of the circle and the third contact site is on an opposing semicircle of the circle;

a plurality of passive retainers carried by the body including at least a first retainer at the first contact site, a second retainer at the second contact site and a third retainer at the third contact site, each retainer including an inclined surface that slopes downwardly toward a central region of the circle to support an edge of the workpiece, wherein the inclined surfaces are arranged to hold the workpiece in a plane spaced apart from the body; and

a sensor carried by the body, the sensor having a moveable pin with a contact region at least partially within the circle, wherein the pin moves generally transverse to the plane as the workpiece is loaded on and unloaded from the end-effector.

2. (Original) The passive end-effector of claim 1, wherein:

the sensor assembly further comprises an optical system having an emitter and a receiver aligned with the emitter across a gap; and

the pin comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the emitter and the receiver.

3. (Original) The passive end-effector of claim 1, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an optical system having an emitter on one side of the bore and a receiver aligned with the emitter across the bore; and

the pin comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and a window that is aligned with the emitter and receiver when the rod is in a first position.

4. (Original) The passive end-effector of claim 1, wherein:

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across a gap; and

the pin comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the first and second contacts of the electrical system.

5. (Original) The passive end-effector of claim 1, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across the bore; and

the pin comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and an electrical conductor that is aligned with the first and second contacts when the rod is in a first position.

6. (Original) A passive end-effector for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece;

a plurality of passive retainers carried by the body, each retainer including an inclined surface that slopes downwardly toward a central region of the circle to support the workpiece in a plane spaced apart from the body;

a sensor carried by the body, the sensor having a moveable pin with a contact region at least partially within the circle, wherein the pin moves generally transverse to the plane; and

wherein the passive end-effector does not include an active member that moves between a release position in which it is engaged with the workpiece and a processing position in which it presses the workpiece against the retainers.

7. (Original) The passive end-effector of claim 6, wherein:

the sensor assembly further comprises an optical system having an emitter and a receiver aligned with the emitter across a gap; and

the pin comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the emitter and the receiver.

8. (Original) The passive end-effector of claim 6, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an optical system having an emitter on one side of the bore and a receiver aligned with the emitter across the bore; and

the pin comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the

bore between the emitter and the receiver, and a window that is aligned with the emitter and receiver when the rod is in a first position.

9. (Original) The passive end-effector of claim 6, wherein:

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across a gap; and

the pin comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the first and second contacts of the electrical system.

10. (Original) The passive end-effector of claim 6, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across the bore; and

the pin comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and an electrical conductor that is aligned with the first and second contacts when the rod is in a first position.

11. (Original) A passive end-effector for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece;

a plurality of passive retainers carried by the body, the retainers being located along the circle, and the retainers being configured to support the workpiece in a plane spaced apart from the body;

a sensor carried by the body, the sensor having an engagement member positioned at least partially within the circle, wherein the engagement moves generally transverse to the plane; and

wherein the passive end-effector does not include an active member that exerts a force against the edge of the workpiece parallel to the plane to press the workpiece against the retainers.

12. (Original) The passive end-effector of claim 11, wherein:

the sensor assembly further comprises an optical system having an emitter and a receiver aligned with the emitter across a gap; and

the engagement member comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the emitter and the receiver.

13. (Original) The passive end-effector of claim 11, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an optical system having an emitter on one side of the bore and a receiver aligned with the emitter across the bore; and

the engagement member comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and a window that is aligned with the emitter and receiver when the rod is in a first position.

14. (Original) The passive end-effector of claim 11, wherein:

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across a gap; and

the engagement member comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the first and second contacts of the electrical system.

15. (Original) The passive end-effector of claim 11, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across the bore; and

the engagement member comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and an electrical conductor that is aligned with the first and second contacts when the rod is in a first position.

16. (Original) A passive end-effector for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece;

a plurality of passive retainers carried by the body, the retainers being located along the circle, and the retainers being configured to support the workpiece in a plane spaced apart from the body;

a sensor carried by the body, the sensor having a lever with a contact region at least partially in the circle, a pivot joint coupled to the lever to allow the contact region to move generally transverse to the plane between a raised position and a lowered position; and

wherein the passive end-effector does not include an active member that exerts a force against the edge of the workpiece parallel to the plane to press the workpiece against the retainers.

17. (Original) A passive end-effector for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece;

a support means for passively supporting the workpiece in a plane spaced apart from the body that does not exert a force against the workpiece parallel to the plane;

a sensing means for sensing proper positioning of the workpiece on the passive support means, the sensing means being carried by the body, and the sensing means having a member positioned at least partially within the circle that moves generally transverse to the plane; and

wherein the passive end-effector does not include an active member that exerts a force against the edge of the workpiece parallel to the plane to press the workpiece against the retainers.

18. (Original) A transfer device for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a transport unit configured to move along a transport path;

an arm carried by the transport unit; and

an end-effector carried by the arm, the end-effector comprising –

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece, the contact sites including at least a first contact site, a second contact site and a third contact site, wherein the first and second contact sites are on a semicircle of the circle and the third contact site is on an opposing semicircle of the circle;

a plurality of passive retainers carried by the body including at least a first retainer at the first contact site, a second retainer at the second contact site and a third retainer at the third contact site, each retainer including an inclined surface that slopes downwardly toward a central region of the circle to support an edge of the

workpiece, wherein the inclined surfaces are arranged to hold the workpiece in a plane spaced apart from the body; and

a sensor carried by the body, the sensor having a moveable pin with a contact region at least partially within the circle, wherein the pin moves generally transverse to the plane as the workpiece is loaded on or unloaded from the end-effector.

19. (Original) The transfer device of claim 18, wherein:

the sensor assembly further comprises an optical system having an emitter and a receiver aligned with the emitter across a gap; and

the pin comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the emitter and the receiver.

20. (Original) The transfer device of claim 18, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an optical system having an emitter on one side of the bore and a receiver aligned with the emitter across the bore; and

the pin comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and a window that is aligned with the emitter and receiver when the rod is in a first position.

21. (Original) The transfer device of claim 18, wherein:

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across a gap; and

the pin comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the first and second contacts of the electrical system.

22. (Original) The transfer device of claim 18, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across the bore; and

the pin comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and an electrical conductor that is aligned with the first and second contacts when the rod is in a first position.

23. (Original) A transfer device for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a transport unit configured to move along a transport path;

an arm carried by the transport unit; and

an end-effector carried by the arm, the end-effector comprising –

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece;

a plurality of passive retainers carried by the body, each retainer including an inclined surface that slopes downwardly toward a central region of the circle to support the workpiece in a plane spaced apart from the body;

a sensor carried by the body, the sensor having a moveable pin with a contact region at least partially within the circle, wherein the pin moves generally transverse to the plane; and

wherein the end-effector does not include an active member that exerts a force against the edge of the workpiece parallel to the plane to press the workpiece against the retainers.

24. (Original) The transfer device of claim 23, wherein:

the sensor assembly further comprises an optical system having an emitter and a receiver aligned with the emitter across a gap; and

the pin comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the emitter and the receiver.

25. (Original) The transfer device of claim 23 wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an optical system having an emitter on one side of the bore and a receiver aligned with the emitter across the bore; and

the pin comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and a window that is aligned with the emitter and receiver when the rod is in a first position.

26. (Original) The transfer device of claim 23, wherein:

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across a gap; and

the pin comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the first and second contacts of the electrical system.

27. (Original) The transfer device of claim 23, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across the bore; and

the pin comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and an electrical conductor that is aligned with the first and second contacts when the rod is in a first position.

28. (Original) A transfer device for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a transport unit configured to move along a transport path;

an arm carried by the transport unit; and

an end-effector carried by the arm, the end-effector comprising –

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece;

a plurality of passive retainers carried by the body, the retainers being located along the circle, and the retainers being configured to support the workpiece in a plane spaced apart from the body;

a sensor carried by the body, the sensor having an engagement member positioned at least partially within the circle, wherein the engagement moves generally transverse to the plane; and

wherein the end-effector does not include an active member that exerts a force against the edge of the workpiece parallel to the plane to press the workpiece against the retainers.

29. (Original) The transfer device of claim 28, wherein:

the sensor assembly further comprises an optical system having an emitter and a receiver aligned with the emitter across a gap; and

the engagement member comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the emitter and the receiver.

30. (Original) The transfer device of claim 28, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an optical system having an emitter on one side of the bore and a receiver aligned with the emitter across the bore; and

the engagement member comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and a window that is aligned with the emitter and receiver when the rod is in a first position.

31. (Original) The transfer device of claim 28, wherein:

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across a gap; and

the engagement member comprises a lever that pivots about a connection, the lever having a first end defining the contact region and a second end in the gap between the first and second contacts of the electrical system.

32. (Original) The transfer device of claim 28, wherein:

the body carries a housing having a bore extending transverse to the circle and a driving member in the bore;

the sensor assembly further comprises an electrical system having a first contact and a second contact spaced apart from the first contact across the bore; and

the engagement member comprises a rod that moves axially in the bore, the rod having a first end defining the contact region extending out of the bore, a second end in the bore between the emitter and the receiver, and an electrical conductor that is aligned with the first and second contacts when the rod is in a first position.

33. (Original) A transfer device for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a transport unit configured to move along a transport path;

an arm carried by the transport unit; and

an end-effector carried by the arm, the end-effector comprising –

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece;

a plurality of passive retainers carried by the body, the retainers being located along the circle, and the retainers being configured to support the workpiece in a plane spaced apart from the body;

a sensor carried by the body, the sensor having a lever with a contact region at least partially in the circle, a pivot joint coupled to the lever to allow the contact region to move generally transverse to the plane between a raised position and a lowered position; and

wherein the end-effector does not include an active member that exerts a force against the edge of the workpiece parallel to the plane to press the workpiece against the retainers.

34. (Original) A transfer device for handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

a transport unit configured to move along a transport path;

an arm carried by the transport unit; and

an end-effector carried by the arm, the end-effector comprising –

a body having a plurality of contact sites located along a circle corresponding to the first diameter of the workpiece;

a support means for passively supporting the workpiece in a plane spaced apart from the body that does not exert a force against the workpiece parallel to the plane;

a sensing means for sensing proper positioning of the workpiece on the passive support means, the sensing means being carried by the body, and the sensing means having a member positioned at least partially within the circle that moves generally transverse to the plane; and

wherein the end-effector does not include an active member that exerts a force against the edge of the workpiece parallel to the plane to press the workpiece against the retainers.

35. (Currently amended) A method of handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

supporting a perimeter edge of the workpiece to ~~suspend~~ hold the workpiece in a plane without exerting a force against the workpiece in a direction parallel to the plane; and

detecting whether a moveable pin located at least partially within the first diameter of the workpiece is displaced by the workpiece in a direction transverse to the plane.

36. (Original) The method of claim 35:

further comprising supporting the workpiece with a passive end-effector having a body with a plurality of passive retainers located at contact sites along a circle corresponding to the first diameter of the workpiece and a sensor assembly carried by the body, the sensor assembly including the pin and an optical system having an emitter and a receiver aligned with the emitter across a gap, wherein the pin comprises a lever having a first end defining

a contact region in the circle and a second end in the gap between the emitter and the receiver; and

wherein detecting whether the moveable pin is displaced by the workpiece comprises sensing a location of the second end of the lever relative to the receiver.

37. (Original) The method of claim 36 where sensing the relative location comprises indicating when the second end of the lever is between the emitter and the receiver.

38. (Original) The method of claim 35:

further comprising supporting the workpiece with a passive end-effector having a body with a plurality of passive retainers located at contact sites along a circle corresponding to the first diameter of the workpiece and a sensor assembly carried by the body, the sensor assembly including the pin and an optical system having an emitter and a receiver aligned with the emitter across a gap, wherein the pin comprises a rod that moves axially within a bore and has a first end, a second end, and a window between the first and second ends; and

wherein detecting whether the moveable pin is displaced by the workpiece comprises sensing a location of the window relative to the receiver.

39. (Currently amended) A method of handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

contacting a perimeter edge of the workpiece with a plurality of passive retainers to ~~suspend~~ hold the workpiece in a plane without exerting a force against the workpiece in a direction parallel to the plane;

engaging a pin of a sensor with the workpiece, the pin being moveable transversely relative to the plane under the influence of the weight of the workpiece; and

detecting whether the pin was displaced by the workpiece in a direction transverse to the plane.

40. (Original) The method of claim 39:

further comprising supporting the workpiece with a passive end-effector having a body with a plurality of passive retainers located at contact sites along a circle corresponding to the first diameter of the workpiece and a sensor assembly carried by the body, the sensor assembly including the pin and an optical system having an emitter and a receiver aligned with the emitter across a gap, wherein the pin comprises a lever having a first end defining a contact region in the circle and a second end in the gap between the emitter and the receiver; and

wherein detecting whether the pin was displaced by the workpiece comprises sensing a location of the second end of the lever relative to the receiver.

41. (Original) The method of claim 40 where sensing the relative location comprises indicating when the second end of the lever is between the emitter and the receiver.

42. (Original) The method of claim 39:

further comprising supporting the workpiece with a passive end-effector having a body with a plurality of passive retainers located at contact sites along a circle corresponding to the first diameter of the workpiece and a sensor assembly carried by the body, the sensor assembly including the pin and an optical system having an emitter and a receiver aligned with the emitter across a gap, wherein the pin comprises a rod that moves axially within a bore and has a first end, a second end, and a window between the first and second ends; and

wherein detecting whether the pin was displaced by the workpiece comprises sensing a location of the window relative to the receiver.

43. (Currently amended) A method of processing a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

loading the workpiece into a transfer device by supporting a perimeter edge of the workpiece to ~~suspend~~ hold the workpiece in a plane without exerting a force against the workpiece in a direction parallel to the plane, and detecting whether a moveable pin located at least partially within the first diameter of the workpiece is displaced by the workpiece in a direction transverse to the plane;

moving the workpiece to a processing station;

unloading the workpiece in the processing station; and

performing a process on the workpiece.

44. (Currently amended) A method of handling a microelectronic workpiece having a perimeter edge circumscribing a first diameter, comprising:

loading the workpiece into a transfer device by contacting a perimeter edge of the workpiece with a plurality of passive retainers to ~~suspend~~ hold the workpiece in a plane without exerting a force against the workpiece in a direction parallel to the plane, engaging a pin of a sensor with the workpiece, the pin being moveable transversely relative to the plane under the influence of the weight of the workpiece, and detecting whether the pin was displaced by the workpiece in a direction transverse to the plane;

moving the workpiece to a processing station;

unloading the workpiece in the processing station; and

performing a process on the workpiece.